

What is claimed is:

1. A method for determining a reference image block in direct coding mode, comprising the steps of:

(1) obtaining a motion vector in a backward reference frame of a B frame with respect to a current image block;

(2) obtaining a motion vector $MV(x,y)$ for direct coding a current B frame image block in accordance with the obtained motion vector of a corresponding image block in the backward reference frame, calculating a forward motion vector MV_F of the current block by using the following formulas:

assuming $scale_factor = 2^{shift_len}$, $td = tp - tb$;

if $mv(i) < 0$:

$MV_F(i) = -(((scale_factor / tp) \times (1 - mv(i) \times tb) - 1) \gg shift_len)$

else,

$MV_F(i) = ((scale_factor / tp) \times (1 + mv(i) \times tb) - 1) \gg shift_len$

calculating a forward motion vector MV_B of the current block by using the following formulas:

if $mv(i) < 0$:

$MV_B(i) = ((scale_factor / tp) \times (1 - mv(i) \times td) - 1) \gg shift_len$

else,

$MV_B(i) = -(((scale_factor / tp) \times (1 + mv(i) \times td) - 1) \gg shift_len)$

where the $scale_factor$ value is a decimal fraction amplification factor; the $shift_len$ denotes times for right shift; MV_F and MV_B denote a forward motion vector and a backward motion vector corresponding to the current block; tb is a distance in time domain between a current picture and a forward reference picture; td denotes a distance in time domain between a forward reference picture and a backward reference picture; MV denotes a motion vector of the corresponding part of the backward reference picture with respect to a forward

reference frame; $MV(x,y) = (MV(x), MV(y))$ is a two-dimensional vector, of which the corresponding components are $MV(x), MV(y)$; $MV(i)$ denotes $MV(x)$ or $MV(y)$; and a/b denotes integering a quotient of a and b towards zero;

(3) the forward and backward image block pointed by the motion vector obtained from step (2) acting as a reference image block of the current image block.

2. The method for determining a reference image block in direct coding mode as claimed in claim 1, wherein in step (2), the following method can be used to obtain a motion vector $MV(x,y)$ for direct coding a current B frame image block:

calculating a forward motion vector MV_F of the current block by using the following formulas:

assuming $scale_factor = 2^{shift_len}$,

if $mv(i) < 0$:

$MV_F(i) = -(((scale_factor / tp) - (tb \times scale_factor / tp) \times mv(i) - 1) >> shift_len)$

else,

$MV_F(i) = (((scale_factor / tp) + (tb \times scale_factor / tp) \times mv(i) - 1) >> shift_len)$

calculating a backward motion vector MV_B of the current block by using the following formulas:

if $mv(i) < 0$:

$MV_B(i) = (((scale_factor / tp) - (td \times scale_factor / tp) \times mv(i) - 1) >> shift_len)$

else,

$MV_B(i) = -(((scale_factor / tp) + (td \times scale_factor / tp) \times mv(i) - 1) >> shift_len)$

where the `scale_factor` value is a decimal fraction amplification factor; the `shift_len` denotes times for right shift; MV_F and MV_B denote a forward motion vector and a backward motion vector corresponding to the current block; `tb` is a distance in time domain between a current picture and a forward reference picture; `td` denotes a distance in time domain between a forward reference picture and a backward reference picture; MV denotes a motion vector of the corresponding part of the backward reference picture with respect to a forward reference frame; $MV(x,y) = (MV(x), MV(y))$ is two-dimensional vector, of which the corresponding components are $MV(x), MV(y)$; $MV(i)$ denotes $MV(x)$ or $MV(y)$; and a/b denotes integering a quotient of a and b towards zero.

3. The method for determining a reference image block in direct coding mode as claimed in claim 1, wherein in step (2), calculating a forward motion vector MV_F of the current block by using the following formulas:

assuming $scale_factor = 2^{shift_len}$, $td = tp - tb$;

if $mv(i) < 0$:

$MV_F(i) = - ((scale_factor / tp) \times (1 - mv(i) \times tb)) \gg shift_len$)

else,

$MV_F(i) = ((scale_factor / tp) \times (1 + mv(i) \times tb)) \gg shift_len$

calculating a backward motion vector MV_B of the current block by using the following formulas:

if $mv(i) < 0$:

$MV_B(i) = ((scale_factor / tp) \times (1 - mv(i) \times td)) \gg shift_len$

else,

$MV_B(i) = - ((scale_factor / tp) \times (1 + mv(i) \times td)) \gg shift_len$).

4. The method for determining a reference image block in direct coding

mode as claimed in claim 1, wherein in step (2),
calculating a forward motion vector MV_F of the current block by using
the following formulas:

assuming $scale_factor = 2^{shift_len}$,

if $mv(i) < 0$:

$MV_F(i) = -(((scale_factor / tp) - (tb \times scale_factor / tp) \times mv(i))$
 $>> shift_len);$

or else,

$MV_F(i) = ((scale_factor / tp) + (tb \times scale_factor / tp) \times mv(i))$
 $>> shift_len;$

calculating a backward motion vector MV_B of the current block by using
the following formulas:

if $mv(i) < 0$:

$MV_B(i) = ((scale_factor / tp) - (td \times scale_factor / tp) \times mv(i)) >>$
 $shift_len;$

or else,

$MV_B(i) = -(((scale_factor / tp) + (td \times scale_factor / tp) \times mv(i))$
 $>> shift_len).$

5. The method for determining a reference image block in direct coding
mode as claimed in claim 2, wherein $scale_factor / tp$, $tb \times$
 $scale_factor / tp$, $td / tp \times scale_factor$ parameters are pre-calculated
prior to the step (1), and a calculated result is stored in a table,
which is directly picked up by the calculation in step (2).

6. The method for determining a reference image block in direct coding
mode as claimed in claim 1, 2 or 3, wherein said $shift_len$ in step
(2) is a natural number larger than or equal to 8.

7. The method for determining a reference image block in direct coding

mode as claimed in claim 1, wherein said obtaining a motion vector of the corresponding block of the backward reference frame comprises: selecting a macro block in a backward reference P frame with the same position as a macro block to be coded in B frame as a corresponding macro block, and obtaining a motion vector of the macro block of the P frame.